



For Supervisor's use only

1

90148



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA



National Certificate of Educational Achievement
TAUMATA MĀTAURANGA Ā-MOTU KUA TAEA

Level 1 Mathematics, 2006

90148 Sketch and interpret graphs

Credits: Three
9.30 am Friday 24 November 2006

Check that the National Student Number (NSN) on your admission slip is the same as the number at the top of this page.

You should answer ALL the questions in this booklet.

You should show ALL working.

If you need more space for any answer, use the page(s) provided at the back of this booklet and clearly number the question.

Check that this booklet has pages 2–13 in the correct order and that none of these pages is blank.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION.

For Assessor's use only		Achievement Criteria	
Achievement		Achievement with Merit	Achievement with Excellence
Sketch, and interpret features of, graphs.	<input type="checkbox"/>	Sketch, and interpret features of, graphs.	<input type="checkbox"/>
		Write equations for linear graphs.	<input type="checkbox"/>
Overall Level of Performance (all criteria within a column are met)		<input type="checkbox"/>	

You are advised to spend 35 minutes answering the questions in this booklet.

Assessor's
use only

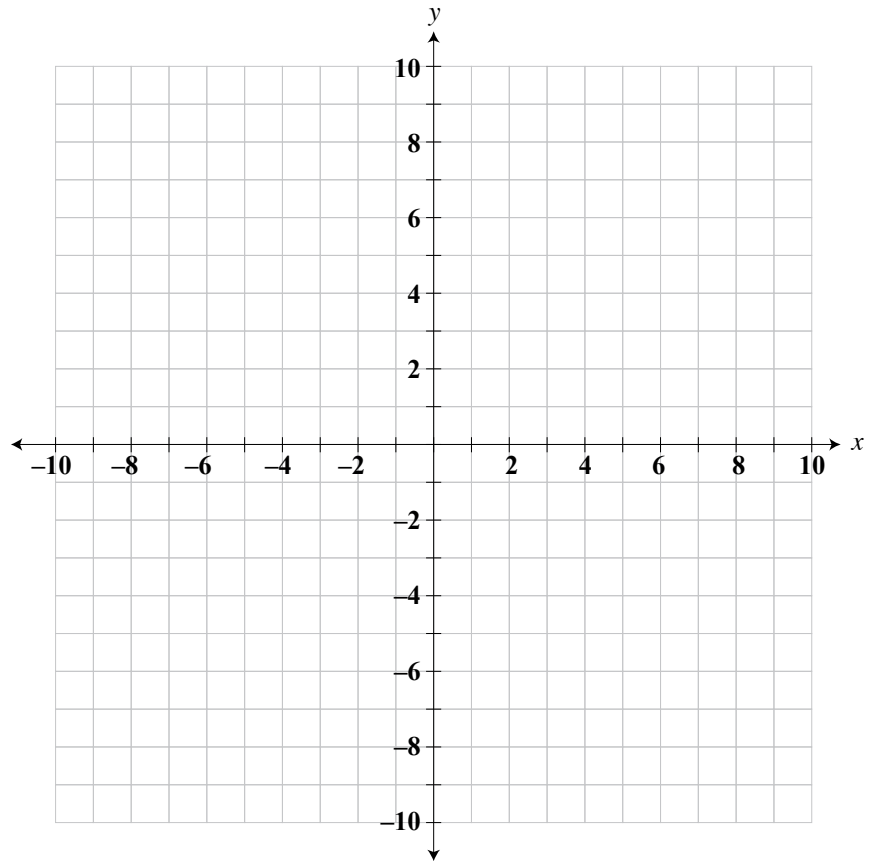
ANOTHER ONE BITES THE DUST

You should show **ALL** working.

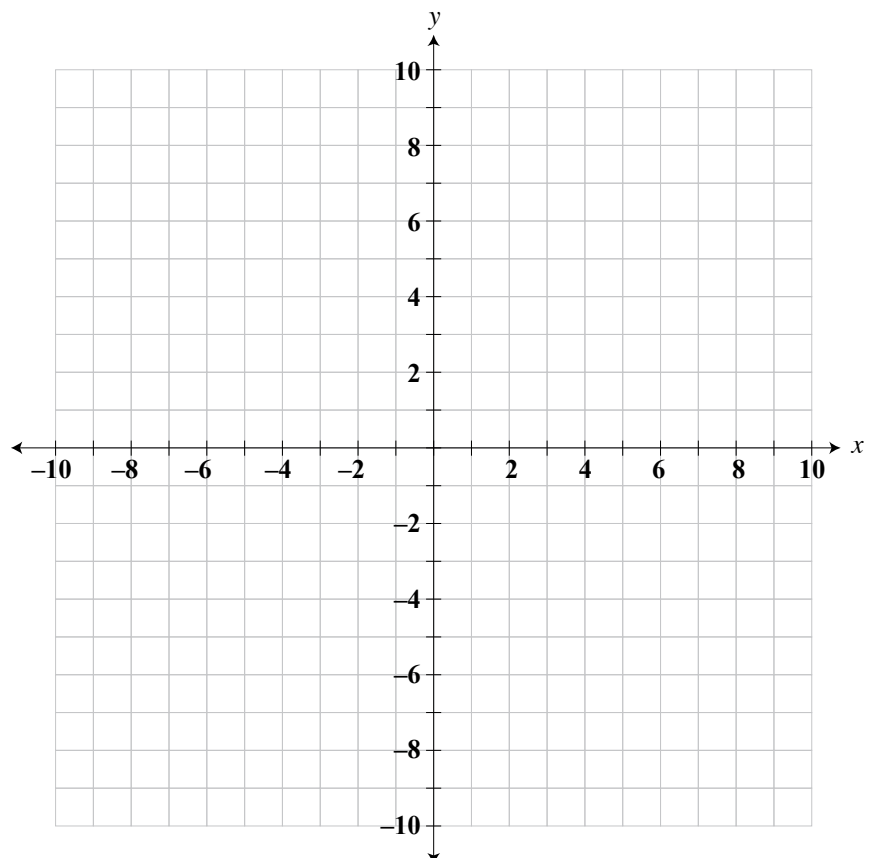
QUESTION ONE

Use the grids alongside
to draw the graphs of:

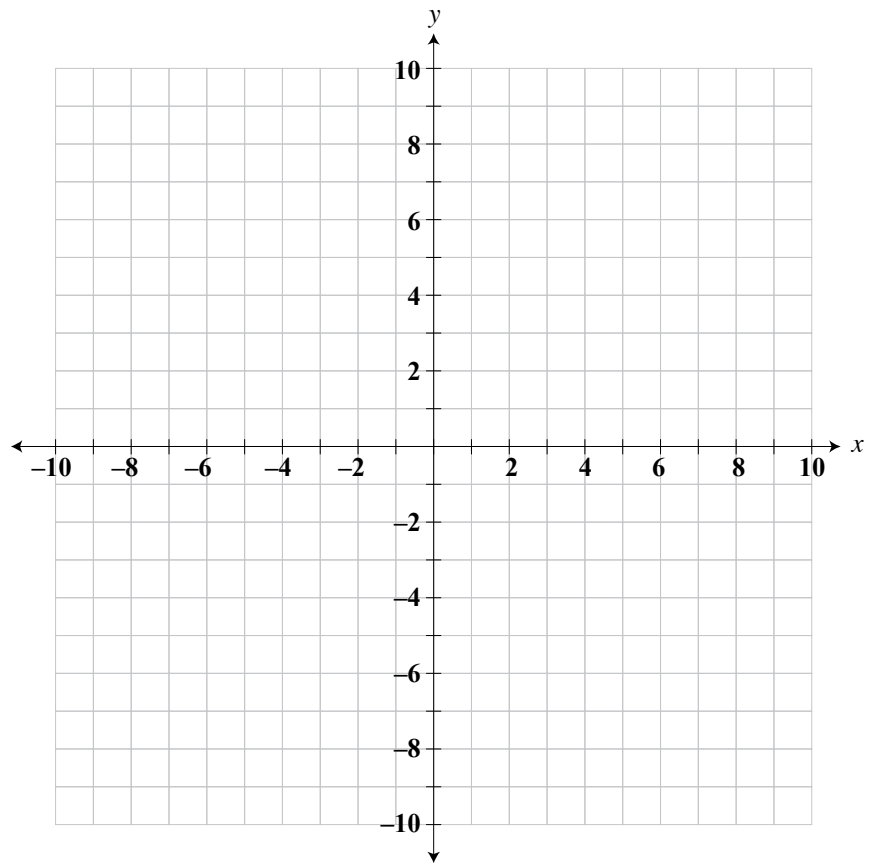
(a) $y = 2x - 5$



(b) $x = 4$



(c) $y = (x - 2)(x + 4)$



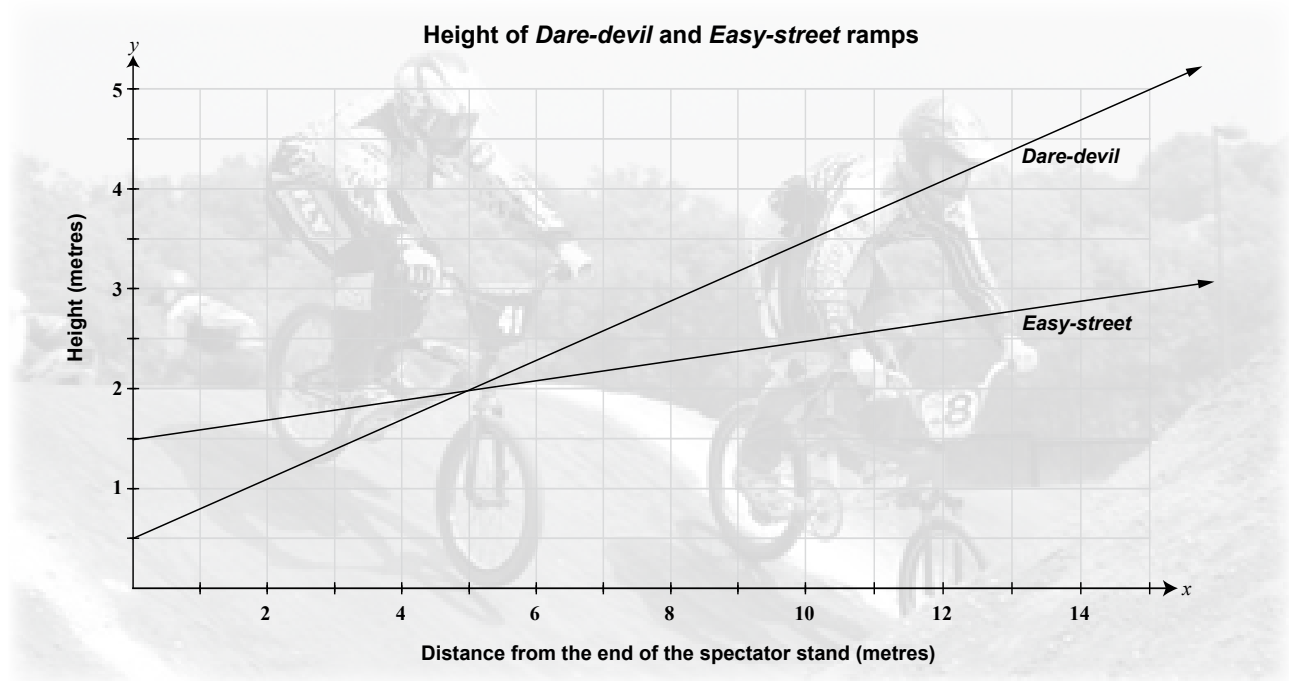
Note: If you need to redraw any of these graphs, you will find blank grids on page 11.
Make sure you show which question you are answering beside each new grid used.
Make sure it is clear which graph you want marked.

QUESTION TWO

Assessor's
use only

Parts of the *Dare-devil* and *Easy-street* ramps can be seen from the end of the spectator stand at a dirt cycle track.

The graph below shows the height above ground level of the two ramps.



- (a) What is the height of the *Dare-devil* ramp **at the end** of the spectator stand?

Height = _____ m

- (b) What is the increase in height of the *Easy-street* ramp over the 15 m from the end of the spectator stand?

Increase = _____ m

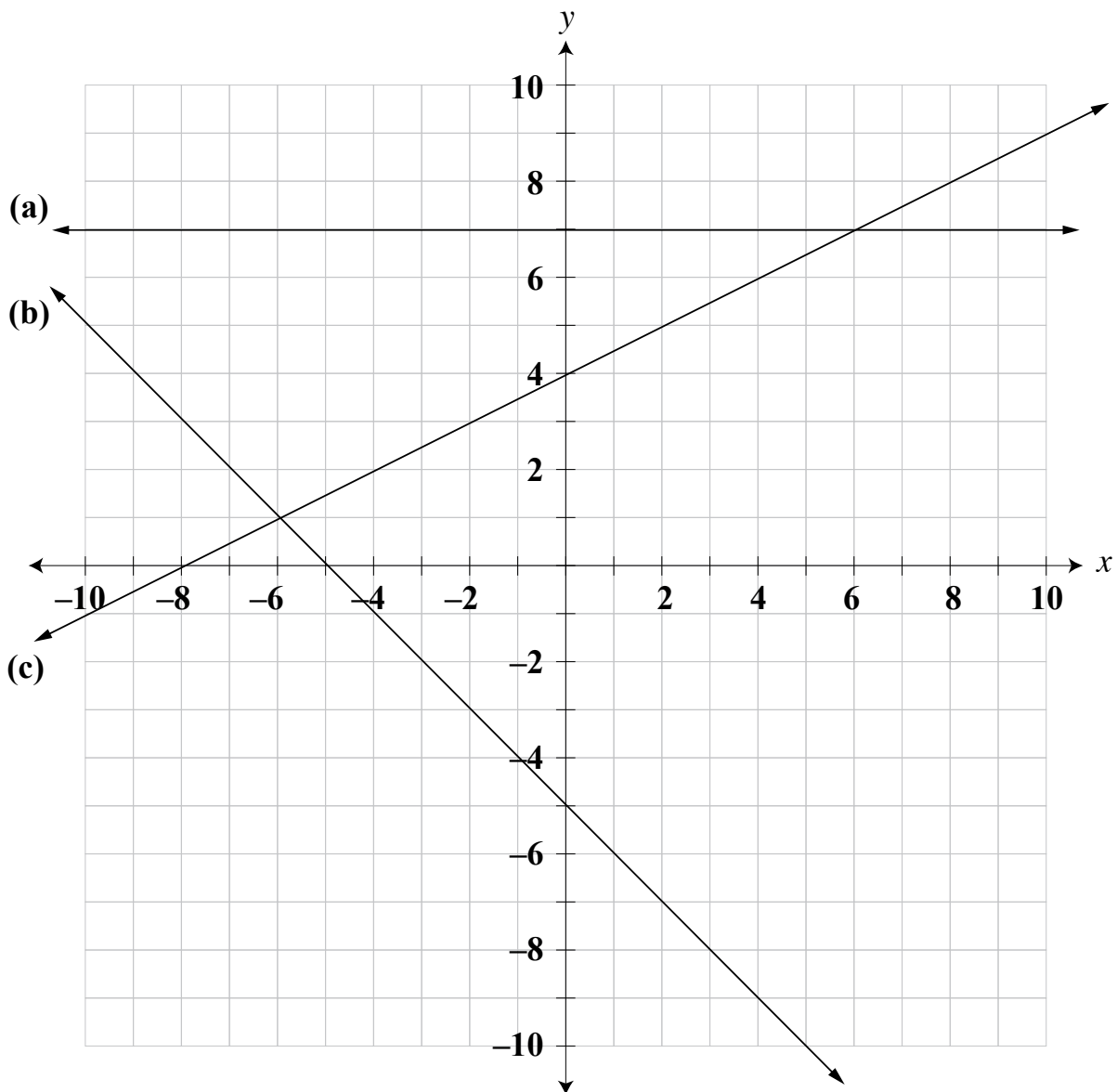
- (c) At what distance, from the end of the spectator stand, are the two ramps the same height?

Distance = _____ m

QUESTION THREEAssessor's
use only

Write the equations of the lines drawn on the grid below:

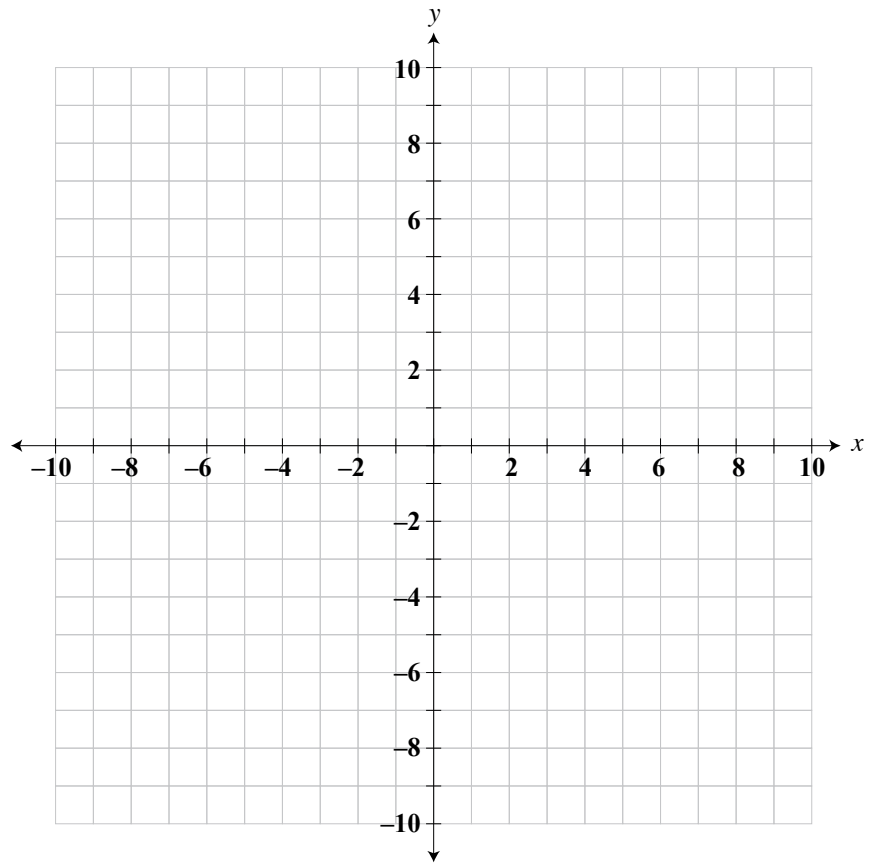
- (a) _____
- (b) _____
- (c) _____
- _____



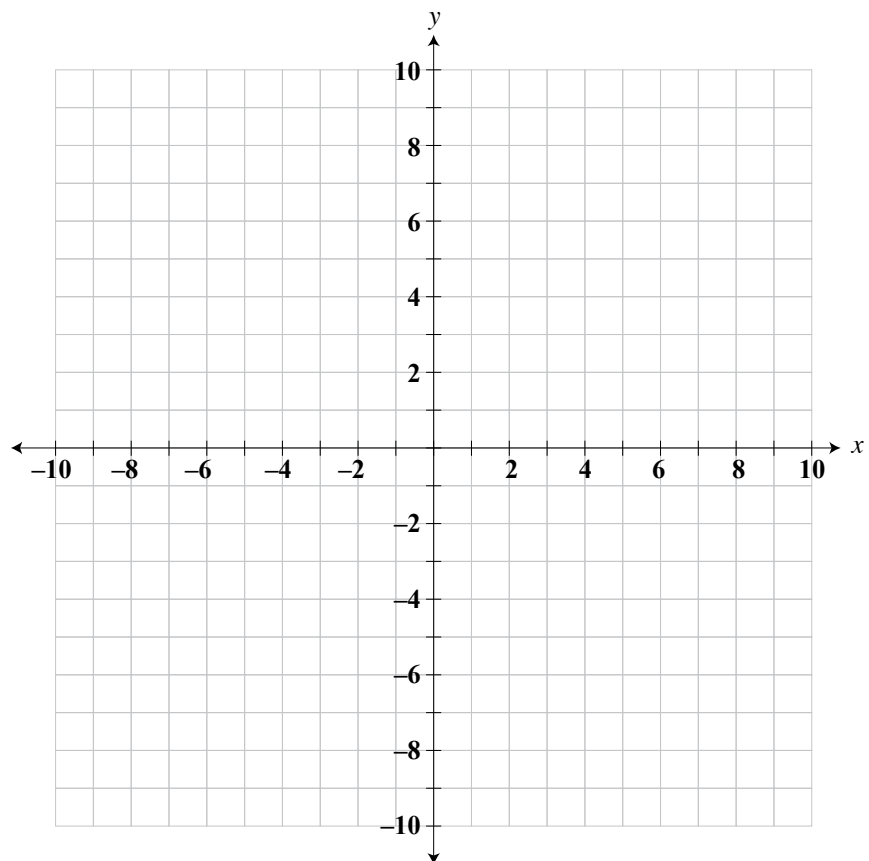
QUESTION FOURAssessor's
use only

Use the grids alongside to draw the graphs of:

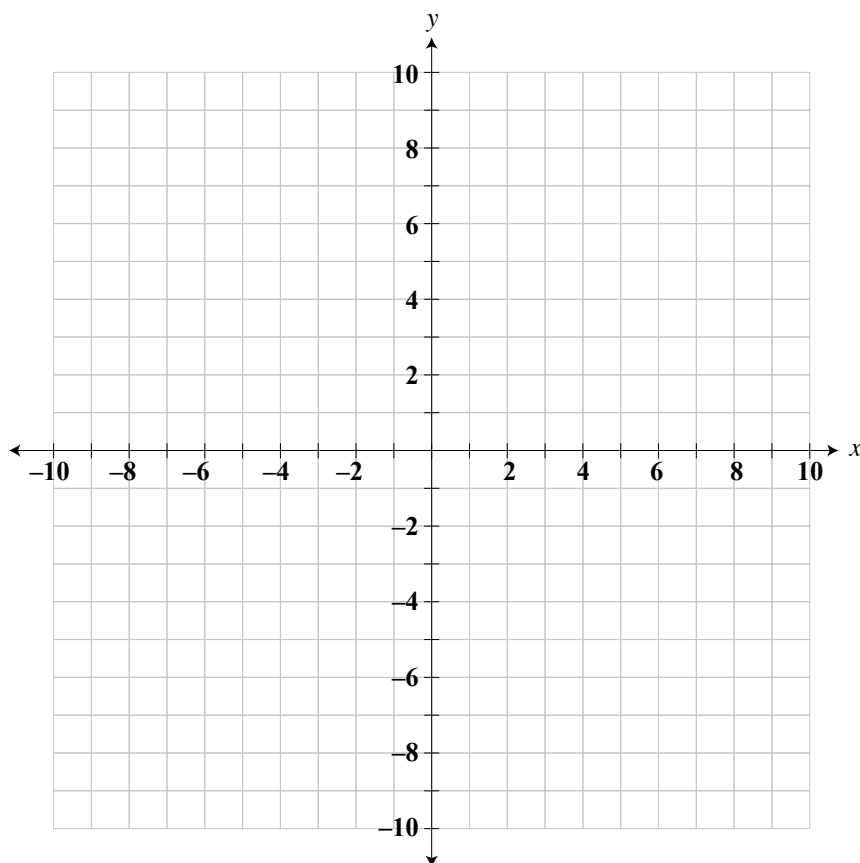
(a) $4y - 2x = 8$



(b) $y = 3 - 2x - x^2$
 $= (1 - x)(3 + x)$



(c) $y = x^2 - 6x$



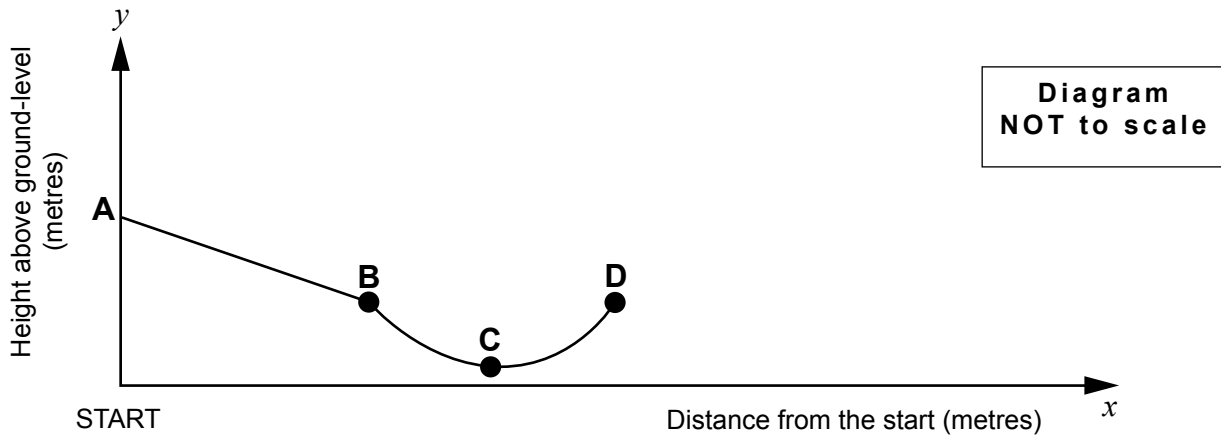
Note: If you need to redraw any of these graphs, you will find blank grids on page 12.
Make sure you show which question you are answering beside each new grid used.
Make sure it is clear which graph you want marked.

QUESTION FIVE

Assessor's
use only

Part of the dirt cycle track is shown on the graph below.

The first section, **AB**, is a straight line and the second section, **BCD**, is part of a parabola.



- (a) The equation of the second section, **BCD**, is

$$y = \frac{3}{25}(x - 45)^2 + 1.$$

It begins at **B**, a horizontal distance of 40 metres from the start.

How high is the start of this second section, **B**, above ground-level?

Height above ground-level at **B** = _____ m

- (b) The point **A** is 6 metres above the ground.
What is the **gradient** of the first section **AB**?

Gradient of the section **AB** = _____

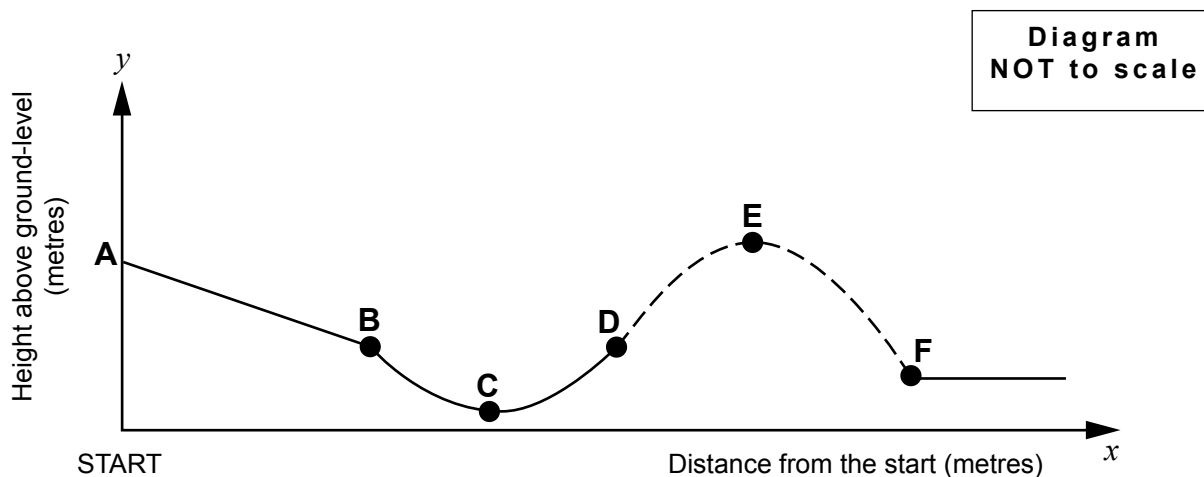
- (c) How high above ground-level is the lowest point, **C**?

Height above ground-level at **C** is _____ m

Assessor's
use only

- (d) In the graph below, the dotted line **DEF** shows the path of a rider performing a jump. The rider leaves the track at **D**, jumps to maximum height at **E**, and lands on a platform at **F**.
- This jump can also be modelled by a parabola.
 - **E** is 8 metres above the ground and a horizontal distance of 60 metres from the start.
 - **B** and **D** are both the same height above the ground.
 - **F** is a horizontal distance of 72 metres from the start.

Calculate the height of the platform at F.



You **must calculate** the height. It is not sufficient to read the height from the graph. You will need to find an equation that models the rider's path, **DEF**, through the air.

Remember, the equation of the second section of the track, **BCD**, was $y = \frac{3}{25}(x-45)^2 + 1$

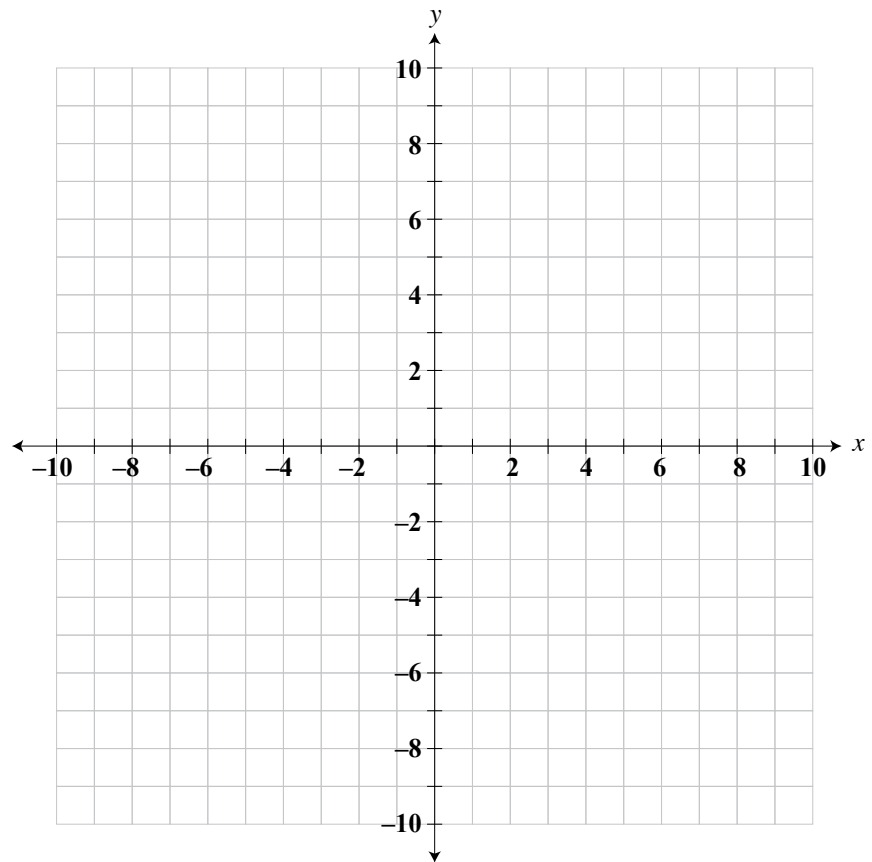
If necessary, continue your working on page 10.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

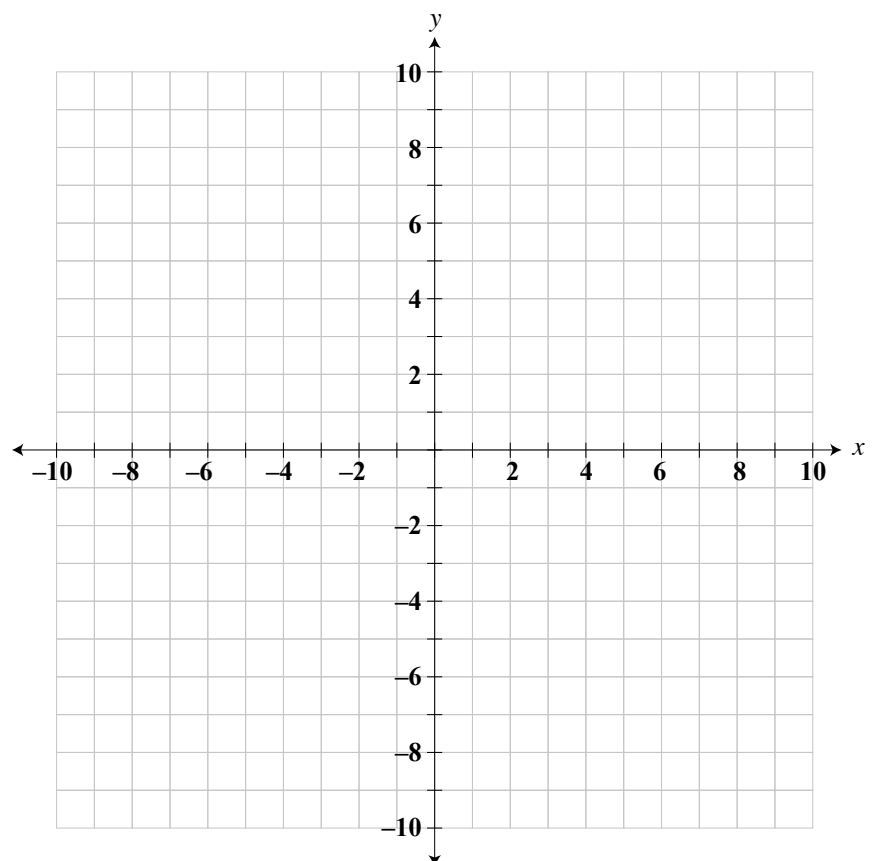
Use these grids if you need to redraw any of the graphs on pages 2 and 3.
Make sure that you show which questions you are answering if you use these grids.
Make sure it is clear which graph you want marked.

Assessor's
use only

Question: _____



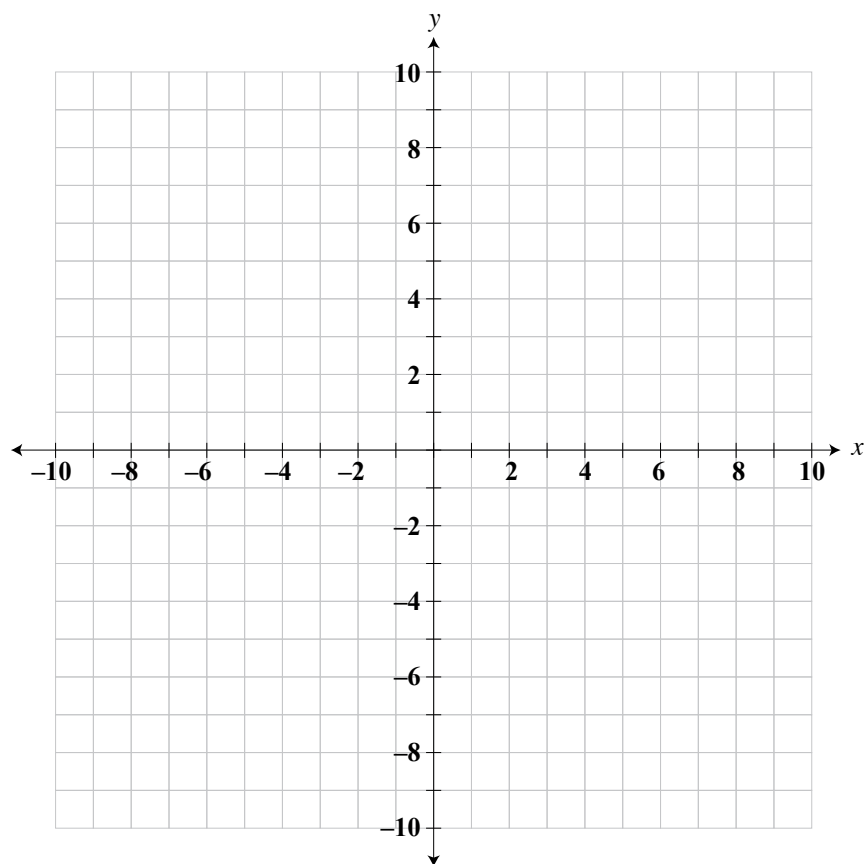
Question: _____



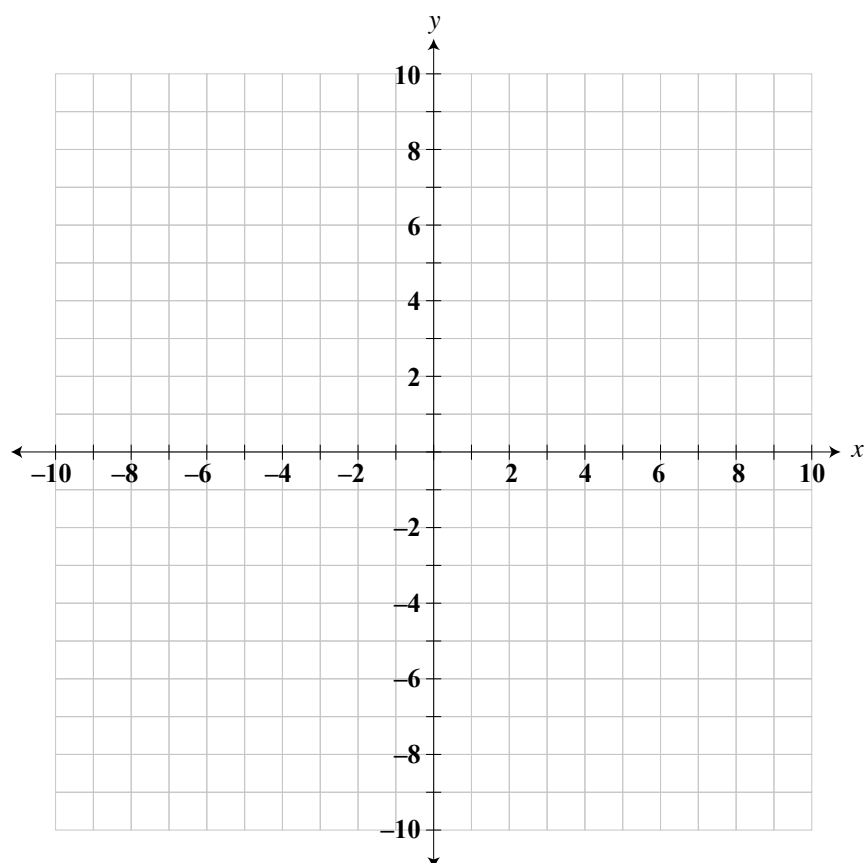
Use these grids if you need to redraw any of the graphs on pages 6 and 7.
Make sure that you show which questions you are answering if you use these grids.
Make sure it is clear which graph you want marked.

Assessor's
use only

Question: _____



Question: _____



[illegible]